

Organisms and Their Environment

4-2 Students will demonstrate an understanding of the characteristics and patterns of behavior that allow organisms to survive in their own distinct environments. (Life Science)

4-2.2 Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.

Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: Students have previously studied environments in 1st grade (1-2.5, 1-2.6) in relation to plants and in 2nd grade (2-2.3) environments in relation to animals. In 5th grade (5-2.3) students will study ecosystems including estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands.

It is essential for students to know that the characteristics of a *distinct environment* (the surroundings where an organism lives) influences the organisms found there. Examples of distinct environments include:

Swamps

- Located in areas with warm temperatures.
- Because swamps have thick plant growth such as ferns and reeds, small bushes and small trees do not thrive due to lack of sunlight.
- The surviving trees are very tall, reaching for sunlight. Standing water causes the trunks of the trees to spread out to provide support.
- An example of a tree found in the swamp, the cypress has “knees”, or roots that come to the surface for oxygen.
- The animals that live in the swamp are very adapted to a water environment, for example alligators, turtles, ducks, frogs, and egrets.

Rivers and streams

- Moving bodies of water that can be found in warm or cold areas.
- They can be fast or slow moving water.
- The speed of the water flow determines the types of plants and animals that live in them or use them.
- There are many plants (bushes and trees) along the banks as well as water plants.
- Many animals (for example fish, crayfish, snakes, and insects) use these plants for food or shelter.

Tropical Rainforests

- Are very humid and warm and have an abundance of rain that leads to lush plant growth (for example, tall trees, vines, ferns, orchids, and other colorful flowering plants).
- Animals that live in the rainforest are often very colorful, to match the variety of plants.
- Many animals are also tree dwellers (for example birds and monkeys), moving across the tree canopy, rather than traveling on the ground.

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Deserts

- Are dry with extreme temperature ranges.
- Some deserts are covered with sand.
- During the day it is very hot, whereas the nights are very cold.
- Most of the plants (for example cacti), and animals (for example lizards, scorpions, and jackrabbits) have ways to conserve moisture, are able to go long periods without water, or can withstand the extreme temperature changes.

Polar Regions

- Are very cold and the amount of daylight varies greatly throughout the year.
- Winters are mostly dark with only moon and starlight, whereas in the summers, there is up to 24 hours of daylight.
- There is little variety of plant life (for example, small plants, lichens, and mosses).
- Animals that live in the polar region (for example reindeer, seals, polar bears, arctic foxes, and penguins) are adapted to these conditions by having extra fat or thick fur for insulation.
- Polar regions include the tundra, arctic and Antarctic areas.

Summary of Characteristics of Distinct Environments					
	Swamps	Rivers and Streams	Tropical rainforests	Deserts	Polar regions
Temperature	Warm-hot	Varies	Hot	Hot-cold	Cold
Water	Abundant	Water environment	Humid	Dry	Dry/ Frozen
Plant life (examples)	Cypress trees, Ferns, Water lilies	Bushes/Trees on banks, Water plants	Abundant Trees, vines, Lush growth	Scarce Cactus	Mostly Lichens, mosses
Animal life (examples)	Alligators Water birds Turtles	Fish, Crayfish Snakes Insects	Birds, Frogs, Monkeys	Lizards, Scorpions, Rabbits	Seals Polar bears Penguins

It is not essential for students to know distinct climate characteristics about biomes or characteristics about estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands (5th grade).

Assessment Guidelines:

The objective of this indicator is to *explain* how the characteristics of environments affect the variety of organisms; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the distinct environmental characteristics (temperature and water) influencing organisms found there. However, appropriate assessments should also require students to *recall* characteristics of the distinct environments listed in the indicator; *summarize* characteristics of and life found in the distinct environments listed in the indicator; or *match* or *illustrate* typical plants or animals with their distinct environment.